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ABSTRACT

This study described and compared 12 classroom teaching innovations that were introduced at the University of Seville, Spain, during academic year 1999-2000. Students completed the Student Demographic Questionnaire (SDQ), and their perceptions of the classroom learning environment were assessed with the Evaluation of University Teaching Activities Questionnaire developed for this study and completed by 665 students. In addition, university classroom innovation practice was analyzed through teaching plans, observations, and semi-structured interviews with 84 students. Significant differences were found in several factors of student biography. Findings shed some light on the neglected theme of the teaching practice of university faculty. Research results and implications for improving university teaching innovation are discussed. Four appendixes contain the questionnaire and supplemental information. (SLD)

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Evaluation of Classroom Teaching Innovations at the University of Seville.

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University of Seville

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EVALUATION OF CLASSROOM TEACHING INNOVATIONS AT THE UNIVERSITY OF SEVILLE

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ABSTRACT

This study describes and compares twelve classroom-teaching innovations that were introduced at the University of Seville during academic year 1999-2000. Students completed the Student Demographic Questionnaire (S.D.Q.) and we assessed their perceptions of the classroom learning environment with the Evaluation of University Teaching Activities Questionnaire (E.U.T.A.Q.). In addition, University classroom innovation practice was analysed through teaching plans, observations and semi-structured interviews. Significant differences were found in several factors of student biography. Findings shed some light on a neglected theme: the teaching practice of University faculty. Research results and implications for improving University teaching innovation are discussed.

1. INTRODUCTION

This study assesses twelve classroom-teaching innovations in different subject areas, introduced at the University of Seville during academic year 1999-2000. Universities are deeply concerned about developing the quality of classroom teaching and student learning abilities and they take great interest in improving classroom teaching. Current Spanish University teaching research reflects three educational assumptions: (1) current practices in classroom teaching evaluation; (2) the use of teaching questionnaire systems for staff development, and (3) the need to make improvements in classroom teaching evaluation practices.

The most common method of evaluating teaching in Spanish universities is by means of student surveys. Any attempt at the evaluation of teaching must address the following research question for students and professors within the higher education system: "What is teaching?". Student perceptual measurement of teaching represents the major approach of this article. First, perceptual assessment is based on different University students' experiences over a one-semester or a one-year course. Second, perceptual assessment entails giving a succinct account of the satisfaction judgments of all University students in a class group. Third, perceptual assessment is associated with students' demographic characteristics and background factors (e.g. course choice concerned with the gender, age, geographic location, class size, prior course grades, work interests and other background and experiences of the students involved). Fourth, perceptual assessment outlines students' interpersonal relationships as a prelude to enhancing their academic focus and, hence, satisfaction with the class social life. Fifth, perceptual assessment may be used for feedback on professors' innovative teaching and learning processes in the form of profiles when coupled with other improvement strategies (e.g. staff development programmes focusing on improving skills, interactive approaches and establishing an environment – physical and social - to support the achievement of high quality student learning). Sixth, perceptual assessment of

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psychosocial characteristics of classrooms is a relatively valid source of criterion variables of curriculum and teaching quality (e.g. creating a defensible climate standards-based assessment). Seventh, perceptual assessment of University classroom learning environment is targeted at the communication process, instead of being a kind of personnel evaluation of the professor who teaches a course. And, eighth, perceptual assessment of classroom climate is well supported by empirical research (Fraser, 1999). In addition, professors are teaching researchers who construct and interpret class actions and their own voices and beliefs.

1.1. Research purposes and hypotheses

The purpose of the present study is twofold. Our first objective is to measure University students' perceptions of classroom climate and to compare their classroom climate dimension scores with those of University students with different background factors. Any scheme for the evaluation of a teaching innovation is likely to have suitable implications for classroom practices and social values. Students in the study are enrolled in a discipline course that emphasized methodology and pedagogy and systematically incorporated innovative aspects of teaching in the curriculum. We hypothesised that student' classroom climate dimension scores measured by the *Evaluation of University Teaching Activities Questionnaire* (E.U.T.A.Q.) (see Appendix I) would be significantly different to those of University students with other demographic characteristics and background factors (e.g. course level, University department, type of subject, gender, age, etc.). (See *Student Demographic Questionnaire* (S.D.Q.) in Table I). Students as recipients of innovation are academic and socially diverse, and may determine the process of a teaching innovation. At least 14 hypotheses on the studying and learning approaches of college students were tested.

(Table I should be put about here)

A second objective of this study is to develop a University teaching theory that is grounded in data systematically collected and analysed (e.g. professors as teaching researchers are constantly comparing pieces of classroom teaching information) (Strauss & Corbin, 1994). Professors participated in the study on a voluntary basis. We hypothesised that professors would make a University teaching model induced from diverse practice data sources.

1.2. Related Literature

The general literature on students' assessments of classroom climate has been growing for more than a decade (Fraser & Walberg, 1991; Aldridge & Fraser, 2000). Researchers and practitioners are demonstrating a significant growing interest in this approach to evaluating University classroom climate in Spain (Toledo, 2000). However, no extensive empirical support for the accuracy of Spanish University students' judgments based on climate assessment is available. Evidence (derived largely from on-demand University teaching quality assessment) is accruing on the potential of classroom learning environment assessments to improve University teaching and learning. Use of classroom climate questionnaires in a Pedagogy discipline class resulted in reflective changes in learning and instruction (Villar, 1999). Other University practitioners also reported that classroom climate assessment led to better curricular integration (Villar, 2001a). In addition, multilevel analysis strategy has been

used in a Spanish study to investigate College size effects and student learning environment perceptions (Villar, 2001b).

2. METHODOLOGY

2.1. Description of the Students

Table I presents the population of this study and the list of variables contained in the *Student Demographic Questionnaire* (S.D.Q.). It comprises 665 University students belonging to twelve innovative subjects within eleven departments. We recorded student background, School and University characteristics, working conditions and home residence. Also, we transformed into continuous all independent variables (e.g. Course level, Age, Complementary jobs, etc.) for ease interpretation. The group of first course level students represented 61.7 percent of the population. Students belonging to the School of Geography and History were the most numerous amounting to 39.2 percent. Some sixty-eight percent were women. The 18 to 21 year-old group of students represented 68.4 percent. Students who had been enrolled on a Pre-University Sciences Course made up 32.9 percent. A large majority of students, 74.4 percent, reported that they had studied in a state High School, and the vast majority, 73.2 percent, said that they lived in Seville. Students performed well in College grades. More than 44 percent said that their academic background was *notable* (e.g. a grade above pass qualification). As for future aspirations, 43.3 percent of students preferred to work outside of the public administration. Most students did not have a scholarship (57.1 percent). The vast majority, 93.1 percent, reported that they were not repeating the subject (e.g. they had not failed the subject in a previous academic year course). Likewise, most students had not failed other subjects (74.6 percent).

2.2. Instruments Used for Data Collection

The core quantitative instruments in this study were (a) the *Evaluation of University Teaching Activities Questionnaire* (E.U.T.A.Q.), which encompasses 25 items in accordance with principles of cognitive and social psychology, to include ten learning dimensions from the cognitive apprenticeship literature. It addresses students' co-construction of knowledge, and professors' scaffolded orientation. In another study, statistics were used to determine the reliability and validity of E.U.T.A.Q., including internal consistency reliability by calculating Cronbach's alpha coefficient for all iems ($\alpha = 0.8635$); examining item intercorrelations and revising scales for final use, and the seven-factor solution produced the most reasonable description of the item structure (59% of the total variance was explained) (Villar, 2001b). And, (b) the *Student Demographic Questionnaire* (S.D.Q.), which is composed of 17 items. This instrument taps selected students' biographical factors (i.e., standard demographic and academic characteristics – age, sex, course level, University department, type of subject, etc. -). These factors were chosen as independent variables to meet the first objective of this study.

After site selection, a number of observers (39), made up of undergraduate students in the field of Pedagogy, wrote down 79 class observations as narrative vignettes, and interviewed 84 students. Then, we selected qualitative methodology to obtain the rich descriptive, narrative, and personal stories that emerge when an innovation is explored in its natural setting. All undergraduate students were trained

specifically for this study. They also collected other artefacts of the practice, including professors' lesson plans, and innovation diagrams and sketches to better understand the meanings with which professors imbue their teaching experiences. In addition, they administered the E.U.T.A.Q. to the students. The professors helped interviewers to select about seven students in each innovation as target students. Semi- structured interviews on how students were learning the content areas in the light of the innovation were the main focus. In the dialogue, ethical considerations (e.g. consent, privacy, etc.) with the students were maintained. Nevertheless, each interviewer made an interview script for each student (see Appendix 2) that was adapted to meet the situation. Also, University professors answered questions about the purpose of their innovation from an interview script (see Appendix 3) made up by the principal researcher. All observations and interviews were transcribed by the undergraduate Pedagogy students and coded by the twelve professors.

2.3. Innovations

The success of a University teaching innovation is dependent to a large extent on professors feeling close to the origin of the project. It follows then, that all twelve professors were concerned with teaching innovation evaluation from its beginning, thus supporting a democratic and participative approach. Professors participating in the innovation evaluation group were aware of the metaanalytic process of on-going and monitoring exercises, which gather and analyse all information. The twelve professors and the principal researcher had group meetings, semi-structured interviews and informal conversations to focus on evaluation processes and issues (e.g. coding processes, personal views).

2.4. Analysis of Data

SPSS for Windows was used for the Analysis of variance (ANOVA) tests that allowed us to discover the significance of the 19 student demographic hypotheses related to the first objective of this study. Qualitative analysis of the content (second objective) was condensed by means of codes, made up of 16 built-up declarations that were defined by the twelve professors as co-authors of the report, that were developed to accomplish the empirical categorizations of the texts (see the Category System in Appendix 4). Codes highlighted teaching practices that were connected to the innovations. Hence, a variety of data sources and a methodological triangulation of class observations, professors and students' interviews and student perceptions were used in this study.

3. RESULTS

3.1. Descriptive Analysis

The initial findings concerning students' agreements for each learning dimension are presented in Table II, which lists percentages of agreement-value of the E.U.T.A.Q. scale, means and standard deviations for all twelve University innovation class groups. (See means profile for E.U.T.A.Q. dimensions of class innovations in Figure 1). First, noteworthy here is the priority that respondents gave to such altruistic environment subscales as Connections and Clarification (mentioned by a third of the population). In contrast, Student autonomy was not particularly high. And second, there is some

indication in the subscale means that *most* students were involved in a known environment, which tended to portray a kind of vague and imprecise climate.

(Table II should be put about here)

(Figure 1 should be put about here)

3.2. Inferential Analysis

One-way ANOVA on each *E.U.T.A.Q.* dimension revealed a reliable difference between groups, according to *Course level* and *University School*. *F*-statistic yielded significant results in a very reduced number of dimensions (only 5) included in *Type of Pre-University Course*, *Academic background*, and *Complementary activities while studying*. The groups with different *Age*, *Complementary jobs while studying (you help doing tasks at home)*, and, those that *Repeat subjects in other courses* were significantly different in four class climate dimensions. To examine the significant effects more closely, students who *repeat this subject* were distinct in two environment dimension perceptions.

Additionally, a significant *F* test was obtained in only one dimension among those students who were different in *Gender*, and who had *Complementary jobs while studying (you teach children)*, *Complementary jobs while studying (you work in an office)*, *Future expectations* and *selected the field studies at the University in a given priority*. The findings on student motivation and teaching interrogation / discussion variation underscore the importance of early professor competency acquisition when innovating teaching (see Table III).

(Table III should be put about here)

These findings provide some support for the hypothesis that University student will benefit cognitively from a rich learning environment when professors offer innovations including many developmentally appropriate activities for classes composed of heterogeneous student factors. No other effects were significant in the analysis which examined differences in the perceptions of student groups according to such variables as *Type of High School Centre where you carried out Secondary Education*, *Residence during the week*, *You receive some type of scholarship in your studies*, and *Housing during the course* (see Table III).

3.3. Analysis of Qualitative Data

We have proceeded as in the collages or pictorial assemblages mixing professors and students' actions and declarations making up a painting or map of the general teaching innovation where the fragments that emerge from the College reality are illustrated by codes giving essence to the innovation sample. Professors have elaborated a theoretical model (Figure 2) derived primarily from examination of transcribed materials (class observation vignettes, clinical interviews, and so far) that maps key codes as specific features of a University teaching committed to excellence as well as their antecedent notions and consequence effects. The model suggests that professor excellence is an extension to the contextual level. Professors have differentiated discrete pedagogical knowledge and have interpreted instructional strategies that are constituted

by class processes and contextual factors through which they assess teaching innovations and measure learning results. To illustrate the categories of the model, we show particular professors' understandings of the nature of innovation. On both theoretical and empirical grounds, we see the teaching framework as useful for the assessment of underlying innovation teaching structure and changes in professors' cognitive structure.

(Figure 2 should be put about here)

3.4. Qualitative findings: conceptual framework of class innovation teaching

The *Instructional Strategies* show an inveterate yearning for Inquiry (IND), as is demonstrated in the following paragraph of a class of Primary Teacher Education, (as has been proven in hypotheses 1, 2, 3, 5, 6, 9 and 18, class discussion was perceived different among students for distinct student biographical factors): The professor began to alter the activity to see what modifications the figure suffers when the order is changed. The professor invites a student to solve the new position. He explains logically how the changes take place according to where the turtle looks. The professor recaptures what has been done previously to recover the acquired knowledge and to find the logic to the problem, and he says, "So that you understand it". And the professor continues saying, "Do you understand it? Is it complicated? Well. Make a conjecture and try to see if it is right". About 7:20 p.m. the professor says that they may work with the program for the last ten minutes of the teaching period. Immediately he proposes a new activity so that students do it alone, but the professor continues directing it. (*New Technologies in the Teaching of Mathematics.* Observation vignette 1).

The intellectual and emotional relations in working groups (TGR) characterized a kind of class teaching style. A student of Architecture Constructions II answered: Yes, we work in groups; we also use groups in other subjects like Construction and History; right now I don't remember others; for other tasks we don't usually form groups, nor do we get involved in this style of class dynamics. To me, groupwork contributes to seeing other people' approaches, to see if I'm mistaken, or right, to share knowledge, not only to see how I face up to the tasks, to feel support... Not everything is to receive, but rather it requires a little bit of responsibility, mainly responsibility. There are people who believe that working in groups consists of some people doing the whole task and at the end everyone signs the paper. (*Task attribution based upon students' learning styles. Individualization.* Student interview 1).

The presence of these categories makes patent the full expression of a teaching that breathes in the depth of inquiry and reflects on the students' working group understanding. To this aim *Teaching skills and techniques* affirm their presence before, during and after class teaching communication. The departure is exactly from Objectives / Aims / Expectations (OME) that are shown condensed in the expression of the question made by a student observer to another student of a class of Business Administration and Marketing (as has been verified in hypotheses 1, 2, 3, 5, 6, 9, 10 and 18, the structuring was not perceived similar by students according to their biographical factors): Question: Would you believe that this subject covers all the expectations that you had of it? Is it what you expected? Answer: The truth is that it is O.K. Professors said what the subject would be like at the beginning of the course. They said it would be very practical. Also, that they would introduce us into a company; that the task would

occupy a lot of time..., and it's as right as it has really been. (*Development of managerial training tools: the case study method.* Student interview 1).

The appearance of the class teaching is a road made up of six categories wrapped by the Presentation of ideas and concepts (EXP) by means of Resources (REC) in a History of Art class (as has been confirmed in hypotheses 1, 2, 3, 6, 9, 13, 14 and 18, the degree to which they understood a problem or the materials was different among students according to their biographical factors, as well as was the relationship of students' new to prior knowledge in hypotheses 1, 2, 3, 10, 11 and 13): All slides were quite clear, which helped the professor's explanation a lot, and they enabled an understanding, knowledge, and follow-up of the churches that were shown. (*Initiation research activity and University teaching.* Observation vignette 5).

For that reason the class crumbles in Activities (ACT) that try to give participation to the student, delaying the monologues of a professor (as has been verified in hypotheses 1, 2, 3, 6, 9 and 10, the degree to which they made their own connections was deduced in different ways by students' biographical factors that differentiated them); a student expressed herself in the following way in a class of Business Administration and Marketing: Question: Can you explain in a general way how you have done tasks in this subject? Answer: Summarizing the topic was the way we did the tasks. Later, a topic was distributed, transparencies made and we studied everything; it was also compulsory to present topics; in my case I had to make a presentation in the first session, therefore I have almost forgotten them. (*Participation approach to business administration by means of projections and case studies.* Student interview 2).

Values (VAL) – born out of Group Work (TGR) – were aspiring to a higher reality, to a concert of notes and an opening feeling that want to be present in teaching: Question: Do you believe that group learning is deeper that individual learning? Why? Answer: If a student works in a group she memorizes much more because the group really resolves many issues for you and it opens other doors, where on your own you close down your mind and you see that you don't have any other exit; you look for support in your peers and you may find an open door. Problems are better solved by working in groups. (*"Development of managerial formation tools: the case study method.* Student Interview 1).

Class teaching is symbolic. It is related to new technologies. Immersion is made in diverse territories of reality from Audiovisual Media (MAV) to Resources (REC). A passage on the use of MAV appears in the following declaration: The first student comments on the legend around the castle. When finishing the legend, while the videotape goes on, she explains some aspects that were shown on videotape. The professor warns that students should comment on the music that was accompanying the videotape images, and they say that it was Carmina Burana, songs from that period. When finishing the videotape, the second student begins to speak, while a third student places a transparency on the overhead projector. Only the slide that shows the fortified walls is projected, while the second student points out the places of interest on the slide. (*Initiation research activity and university teaching.* Observation vignette 4).

The use of MAV has several forms of expression, as the use of REC in a class of Psychology that synthesizes a daily explanation (as has been verified in hypotheses 1, 2

and 3, the degree to which audiovisual media was used varied according to students' biographical factors). This can be seen in the following paragraph: She usually explains the topic with the support of different teaching materials such as the overhead projector or the videotape. (*Role-playing of conflicting situations among handicapped students, their parents and the school.* Student Interview 6).

Finally, Evaluation (EVA) reels off understanding of a possible learning, that a professor commented to an observer in the initial contact of his class innovation:
The evaluation will be carried out in two ways. First, we will keep in mind the quality of task realization; then, exposure and participation. It's compulsory to have an attendance of about 80% to reach a pass qualification. (*Participation approach to business administration by means of projections and case studies.* Initial interview with a professor).

The articulation of an innovation depends on the flexibility of a College and other class factors that converge in the *Context factors*. The Physical Environment (EFI) reflects the architecture on which the faithful image of a teaching style is: The class is located in one of the corridors of the School of Philology. This is longer than it is wide and it has capacity for 75 students, since it's furnished with 15 benches, with five seats in each one of them. There is only one entrance. It's quite luminous and in it we find three windows that look onto an interior patio. On the platform, where the professor's table is we can observe a blackboard and to the sides a piece of furniture where the videotape apparatus and a screen for slides are located. Another teaching resource is a computer projection unit that hangs from the ceiling. (*Initiation research activity and university teaching.* Observation vignette 2).

That is different when EFI includes new technologies: Students are sitting at the computers; one per computer. They switch on the computers and are being introduced to the program "Win-logos", with which they will work during the class period. The professor has not mentioned to them how they may access it. Students already know the program and access it without any problems. (*New Technologies in the Teaching of Mathematics.* Observation vignette 3).

Also, class teaching-learning time has to be replayed in a curriculum innovation, because if we move the needles of the clock, we modify people's effort and destination:
Time is always the negative aspect; class periods are very long and they become very dull. When it's compulsory, that is the worst aspect, since the fact of having to attend the classes obligatorily forces me to have to miss the rest of the classes; also, I work the whole morning and it messes up my timetable for the whole afternoon so I can't combine other subjects. (*Participation approach to enterprise administration by means of projections and case studies.* Student interview 3).

A curriculum innovation must engage students in activities that produce a positive class *Climate* that value knowledge as socially constructed and ethic of caring. In this case, the atmosphere that a professor describes when he was interviewed refers more to the departmental environment as a workspace: Anyway, what's fundamental for the introduction of the innovation is an atmosphere of open and participative work where tasks well-done are rewarded, even if in an informal way, like any initiative that supposes an improvement in our teaching work. In our department these intrinsic rewards for innovative work have always been regularly encouraged. But in recent

times people are looking for more concrete results as much for the depart. ient as for the professors' work and career, and people are leaving aside the most idealistic postures on teaching, to concentrate on what you can achieve and the benefits that that generates. (*Participation approach to business administration by means of projections and case studies*. Professor interview).

It is not a fiction that social *Relationships* (REL) in the class presented as facts refer to the tangible atmosphere of a class. Cordiality in social relationships has the hope of giving students security: The professor asked the student if something was wrong with her, but she was silent. The fear to present a task before the entire group has made her so nervous that she cannot speak, so they have to take a break for several minutes in her lecture (...). Meanwhile, the professor tries to encourage her, calming her down and giving her some advice. Finally, they decide to carry out the presentation in a different way, interviewing the student who would simulate being an employee of the company. In this interview, all other group members participate. Despite this, she continued to find it difficult and her place was later taken by one of her peers, as she was left speechless again. (*Development of managerial formation tools: the case study method*. Observation vignette 9).

The utopia of our University time is almost always limited to looking for a form of *Collaboration / cooperation* (CCO) in teaching which is a class participation pattern that provides the best chemistry for interaction and escapes from the competitiveness (as has been known through hypotheses 1, 2, 3, 5, 6, 12 and 13, the degree in which they reached agreement was very different according to student biographical factors). It is necessary tutors facilitate and develop personal and social needs, if students demand it: Question: What are in a reasoned way the positive and negative aspects that you see of this subject? Answer: Well, the most positive thing that I think is that we have related to the different students that we were in the group, because most didn't know each other and, at the end it's not that we have become very good friends, but you simply know people and we have interrelated very well. And, the presentation of the task also shows you how to speak in public, and that helps you. And the debate has seemed very good to me; it's a thing that memorizes other students' perspectives, others' opinions; then, you share ideas. You learn with the knowledge that you already have and you share ideas, you know? And that has seemed fantastic. (*Participation approach to business administration by means of projections and case studies*. Student Interview 6).

Motivation or *interest* (MIN) is the arrow that arrives to the irreversible destination of personal change. University students must learn how to manage their learning, and instructional programs should adapt to learner differences in their motivation and/or interests, including student choice as a key element (as has been known by hypotheses 1, 2, 3, 4, 5, 13, 17 and 18, the students noticed a different degree of involvement due to their biographical factors). In a class situation, tutor and students' adherence to teaching development is shown: Students show great interest for the topic, constantly participating by means of brief interventions that show their competence through making announcements. Later a discussion of the global task is influenced by suggestions, doubts, methodology, etc. In the discussion, all students participate in an organized way and regulate their own interventions. (*Development of managerial training tools: the case study method*. Observation vignette 2).

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The *Projection* or *implications* (PIN) of an innovation are decorated with rational foundations about change in the course of an action and in the persistence of singularity (as has been inferred from hypotheses 1, 2, 3, 10 and 15, students - according to their biographical factors - varied in the degree of interest): Question: Because students do practically everything in this subject, do they have a very active role? Do you believe that you learn more in this way? Answer: Yes, we have centred our project on the system of quality; then last year, we had a course on quality, but really quality in theory is very different to understand that in practice; in practice it's even simpler. You see a system of quality imposed upon a company and they explain it to you, and you say, "I don't understand it", but really in practice, you say yes. Then we have informed ourselves through class notes that we had from a second-year course, and other books; then, it's constant self-learning, day by day. (*Development of managerial training tools: the case study method*. Student interview 1).

With the subtle brushstrokes of student perceptions we have painted a class portrait. *Student Autonomy* is the learning dimension that was closer to the value *I don't know* of E.U.T.A.Q. Architecture students were not aware of whether they had acquired responsibilities or changed their attitudes: Question: How do you value professors' involvement? Answer: I believe that professors maybe go a little blindly; they try to do everything they can think of, regardless of whether it's correct or not; if it's correct they repeat it and if not, then they don't; it's all trial and error, but at least they're trying something, within their limitations. On the part of the students, there are people that are interested and they participate, and at the same time there are people that do not care; I don't know if it's because they don't like the field of study and they're here because they've not been able to study something else. (*The organization of a thematic class of Architecture as a strategy of education innovation*. Student interview 2).

Evaluation was in the middle of the values *Totally of agreement* and *Agreement* of E.U.T.A.Q. Students coincided in appreciating that some initiatives like teaching innovation would significantly improve the quality of teaching. The more creative, more self-reflective, that is how we see professors who do not doubt to constantly undergo student as it happened in the Department of Business Administrations and Marketing:
The professor begins saying, "Thank you for attending the evaluation session to those that have come voluntarily"; afterwards, he explains what the evaluation session will consist of. "We want you to evaluate us; this somehow will help us for next year's course; we are open to modifications that may be made to our teaching program". (*Participation approach to business administration by means of projections and case studies*. Observation vignette 6).

3.5. Discussion

We vigorously confirmed hypothesis 1 *Course level* (all dimensions); as happened with hypothesis 2 *University School* (all dimensions). We very weakly confirmed hypothesis 3 *Gender* (a dimension) and hypothesis 4 *Age* (four of ten dimensions); half of hypothesis 5 *Type of Pre-University Course* (five of ten dimensions); as in hypothesis 6 *Academic background* (five of ten dimensions); and also in hypothesis 7 *Complementary activities while studying* (five of ten dimensions); but, hypothesis 8 *Complementary jobs while studying. You teach children* was very weak (one of ten dimensions); and as hypothesis 9 *Complementary jobs while studying. You work in an office* (one of ten dimensions); nevertheless, hypothesis 10

Complementary jobs while studying. *You help doing tasks at home* was more powerful (four of ten dimensions); it was very weakly confirmed hypothesis 11 *Future expectations* (a dimension); as hypothesis 12 *The field studies at this University were chosen...*(a dimension); it was very dim or weak hypothesis 13 *You repeat this subject* (two of ten dimensions). Finally, it was partially verified hypothesis 14 *You repeat subjects of other courses* (four of ten dimensions). Overall, the findings indicate that class innovation teaching structure can produce significant changes in the functioning of students' perceptions. The classroom learning environment knowledge and experiences gained in the innovation-teaching arena are different according to University context factors.

Professors never work in a vacuum. It is through constant exposure to and filtering through teaching innovations that professors maintain the professional knowledge, skill, and techniques they use to help their students learn. Much call for University reform has focused on changing scientific research programs, the evaluation of the field of studies' curriculum, and University teaching, but this research suggests a need to change the "teaching setting" from a sociocognitive perspective. A University teaching innovation is a kind of new educational culture within which students are bathed in new learning rhythms.

Moreover, all the innovations we studied exhibited all five characteristics: (1) fostering the inquiry style, (2) valuing dynamic and participant methodology, (3) creating significant tasks that provide students with interest, (4) engendering expressive teaching aided with new technologies to make teaching records (notes by means of transparencies, debates about movies, urban field experiences, cross-disciplinary approaches, topics and tasks close to life, etc.), and (5) coordinating efforts to improve University quality teaching. Overall, the professors are in touch with their students, their profession, their colleagues, and the University at large.

3.6. Implications

1. *Appraisers / participants*. Innovative professors testified to the lively, current reflection on teaching at University. As students according to background factors unequally perceived the effects of teaching innovations, these characteristics should be kept in mind when planning and offering new innovations to students. At the least, class interventions should be made to modify motivation and interrogation / discussion of students' perceptions.

2. *Evaluation research design*. This study insinuates the necessity to make case studies close to the professional place in function of some context factors and characteristics of students.

3. *Analysis of data*. Although naturalistic research will be helpful for developing a grounded University teaching subjective theory, a great deal more attention should be focused on innovations that do develop professors to high levels of analysis and interpretation of educational practice as specific texts and documents.

4. *Development training programs for knowledge and change of professional beliefs*. Any University should reach a symbiosis between evaluation of teaching, institutional

evaluation of fields of study and professional development by means of favouring development programs based on personal reflection on class teaching.

5. *Formative evaluation of teaching innovation.* If the hypotheses are true, then we need to reconsider what must change if we are to make class innovations more effective learning environments. Besides, exercises in teaching innovation should be incorporated when evaluating University teaching like sediments where substance and incidental teaching and other learning values are revealed.

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Appendix I

Evaluation of University Teaching Activities Questionnaire (E.U.T.A.Q.)

For each sentence select the value of the answer that best suits your perception, draw a circle around the your choice on the attached answer sheet.

Totally agree	Agree	I don't know	Disagree	Totally disagree
1	2	3	4	5

Dimension A. CLARIFICATION (degree to which University students are given explanations, examples and multiple forms of understanding a problem or difficult material).

1. Professor clarifies difficult aspects of this innovative activity.

2. Professor elaborates the most confusing information of this innovative activity by means of outlines, diagrams or illustrations of the main ideas.

Dimension B. STUDENT AUTONOMY (student perception that University teaching is student-centred and that she has been offered the opportunity to make decisions on her learning).

3. This innovative activity has changed my vision on the University student's role.

4. This innovative activity has changed my attitude towards the subject and the way of dealing with University studies.

5. I assume responsibilities in this innovative activity.

6. I suggest possible educational problems and tasks with peers.

Dimension C. PROFESSOR SCAFFOLDING (degree to which professors demonstrate the steps or structure of a problem and provide keys and help to complete the innovative activity with success).

7. This innovative activity gives me keys to solve problems but it doesn't direct me to a specific answer.

8. This innovative activity offers me enough information to be successful.

9. The professor gives me feedback while I solve a problem in this innovative activity.

Dimension D. STUDENT PRIOR KNOWLEDGE (degree to which learning activities are personally excellent and related to University students' prior knowledge and practical skills).

10. This innovative activity relates new information to what I have learned previously.

11. I use ideas and information that I know to understand something new.

12. I have developed other cognitive capacities in this innovative activity (e.g. analysis, synthesis, critical thinking).

Dimension E. CONNECTIONS (degree to which University students establish their own knowledge connections and generate their own learning products).

13. This innovative activity helps me to investigate, build and relate ideas and facts.

14. I explore how information relates with other topics and subjects.

Dimension F. INTERROGATION / DISCUSSION (degree to which conjecture, questioning, and discussion in this innovative activity is fostered).

15. This innovative activity encourages University students to ask questions and discuss answers given in a book.

16. I discuss correct and incorrect solutions to problems.

Dimension G. EXPLORATIONS BASED IN NEW TECHNOLOGIES (degree to which new technological tools and other academic resources facilitate University students' idea generation and knowledge construction).

17. This innovative activity develops University students' other study capabilities (e.g. handling of tools, document search, library use).

18. I find new information about the topics and subjects using new technologies.

Dimension H. COLLABORATION AND NEGOTIATION (degree to which University students make social interactions with other students to give meanings and obtain agreements about teaching activities and viewpoints).

19. I share ideas, answers and visions with my professor and peers in this innovative activity.

20. I learn how to think about a problem from peers and to consider their points of view.

Dimension I. MOTIVATION (degree to which University students are involved in an innovative activity).

21. I am motivated to work in this innovative activity.

22. This innovative activity improves my opinion about the content of the subject (practical vision).

23. I get more involved in this innovative activity than if I studied it in a theoretical way (useful vision).

Dimension J. EVALUATION (degree to which University students evaluate an innovative activity).

24. I believe that this innovative activity develops professors' interest in teaching.

25. I believe that innovative activities like this would significantly improve the quality of University teaching.

ANSWER SHEET

A: CLARIFICATION					
1.-	1	2	3	4	5
2.-	1	2	3	4	5
B: STUDENT AUTONOMY					
3.-	1	2	3	4	5
4.-	1	2	3	4	5
5.-	1	2	3	4	5
6.-	1	2	3	4	5
C: PROFESSOR SCAFFOLDING					
7.-	1	2	3	4	5
8.-	1	2	3	4	5
9.-	1	2	3	4	5
D: STUDENT PRIOR KNOWLEDGE					
10.-	1	2	3	4	5
11.-	1	2	3	4	5
12.-	1	2	3	4	5
E: CONNECTIONS					
13.-	1	2	3	4	5
14.-	1	2	3	4	5
F: INTERROGATION / DISCUSSION					
15.-	1	2	3	4	5
16.-	1	2	3	4	5
G: EXPLORATIONS BASED IN NEW TECHNOLOGIES					
17.-	1	2	3	4	5
18.-	1	2	3	4	5
H: COLLABORATION AND NEGOTIATION					
19.-	1	2	3	4	5
20.-	1	2	3	4	5
I: MOTIVATION					
21.-	1	2	3	4	5
22.-	1	2	3	4	5
23.-	1	2	3	4	5
J: EVALUATION					
24.-	1	2	3	4	5
25.-	1	2	3	4	5

Appendix 2

Students' interview script

1. What does teaching mean for you?
2. What do you think about the teaching style and materials you use in this subject?
3. What do you believe about your learning? Do you learn more, better, when you work individually or in a group?
4. Do you work in groups in this subject? What does it give to you, and what demands does it place on your personal style?

5. Point out positive aspects of this subject's methodology.
6. Point out negative aspects of this subject's methodology.
7. What would you change or how would you believe that you might improve your learning?
8. Score from 1 to 10 the relevance of this subject for your career or future job. Explain why?
9. What do you believe is the reason for the ration between the number of students who attend class in this subject and the number registered for it?
10. Does this subject meet your expectations of it?
11. In general, are you satisfied with teaching at University? How can you improve it?

Appendix 3

Professors' interview script

1. How can you introduce an innovation of University teaching in the organizational culture of your department and College? Please, point out what decisions you would make.
2. Please, indicate how your innovation has affected students: changes in the way they study, modification of expectations, solidarity and care in learning, etc.
3. Did collaboration / cooperation exist with other colleagues of your area, department or College before? Please, specify the terms or aspects of the collegiality / cooperation.
4. What difficulties / rejections, blockades or reticence towards implementing innovation have you perceived in the class atmosphere?
5. What kind of anxieties or satisfactions have you awakened in students and in yourself by implementing innovation?
6. Would you seek to continue with this innovation project next year? Please, give reasons.
7. Have there been changes between the design and report of the innovation project? If so, please point out the aspects that have changed and the justifications.
8. Were you rewarded somehow for the energy and effort made in carrying out the innovation? Please, indicate how the rewards provided incentive, or acted as intrinsic / extrinsic motivation.
9. Summarize how many students have been the direct beneficiaries of your innovation.
10. Conclude making a self-evaluation of your activity in a scale from 1 to 10 (being 1 totally unsatisfied - I won't repeat this initiative - and 10 - totally satisfied - I'll repeat the innovation -; and 5 I don't know what I'll do).

Appendix 4

Category System

CATEGORY	CODE	**DEFINITION**
PHYSICAL ENVIRONMENT	EFI	Physical space where the formative activity is developed with all its elements (size, distribution, light, temperature...).
CLASS ATMOSPHERE	ACL	Social climate - participation, trust or mistrust, etc. - where a class session is developed.

OBJECTIVES / AIMS / EXPECTATIONS	OME	What professor and students expect from the teaching and learning process.
PRESENTATION	EXP	Educational strategy in which the professor acts as a transmitter and the students like receivers of information.
INQUIRY	IND	Teaching method based on questions that the professor outlines to the students.
ACTIVITIES	ACT	Task collection that a student carries out individually.
GROUP WORK	TGR	Task collection carried out by the participation of a group of students under a common objective.
EVALUATION	EVA	Measure of attained results. It includes the evaluation of the activity, the assessment of students, and the evaluation and improvement of quality.
RELATIONSHIP	REL	Cordial and friendly relationships between professor and students.
AUDIOVISUAL MEDIA	MAV	Audio and / or videotape equipment used to transmit information to students.
RESOURCES	REC	Written curriculum and communication materials, as books, reports, articles, programs...
COLLABORATION / COOPERATION	CCO	Interrelation style among students to carry out the innovation (among different disciplines, majors, courses, groups, people, etc.).
MOTIVATION OR INTEREST	MIN	The degree of enthusiasm and expectations that a professor and students show in the implementation of the innovation.
VALUES	VAL	Development of values by the professor or students (solidarity, mutual respect, self-confidence, competition, individualism, social concern, hierarchy, etc.).
PROJECTION OR IMPLICATIONS	PIM	Implications of results or conclusions of the innovation to improve teaching, future professional life of students, or society.
TIME ADAPTATION	ADT	Appropriate time development of the innovation; time invested by a professor and students in the innovation.

Table I

Student Demographic Questionnaire (S.D.Q.) (N = 665)

Course level	First 61.7%			Second 13.4%		Third 17.1%		Fourth 3.3%		Fifth .3%		
University School	Sch. of Geography and History (39.2%).	Sch. of Medicine (3.6%).	Sch. of Management (12.6%).	Sch. of Education (17.9%).	Sch. of Law (1.4%).	Sch. of Psychology (9.2%).	Sch. of Architecture (9.2%).	Sch. of Technical Architecture (9.2%).				
Departments and subject innovations *.	1	2	3	4	5	6	7	8	9	10	11	12
Gender	Male 31.7%								Female 68.3%			
Age	18 to 21 year-old 68.4%			22 to 23 year-old 18.8%			24 to 25 year-old 6.2%			older than 25 years 6%		
Type of Pre-University Course	Sciences 32.9%			Arts 27.7%			Mixed Sciences 6.9%			Mixed Arts 21.8%		
Type of High School Centre where you carried out Secondary Education	Public 74.4%			Private school 12.2%			Subsidised Private school 8.4%					
Residence during the week	Seville-city 73.2%			Village 25.1%			Other towns					
Academic background	3rd class 42.6%			2nd division 44.1%			2nd class 1st division 4.1%			1st class 2.9%		
Complementary activities while studying. (125 out of 665 answers = 18,8%)	You are also studying another University degree 2.3%			You are preparing for State competitive examinations) 1.4%			You attend some other course 15.2%					

Complementary jobs while studying	You teach children: 1hour: .6%; 2hours: 2.3%; 3hours: 2.1%. (39 out of 665 = 5.9%)	You work in an office: 1hour: .2%; 2hours: .5%; 3hours: .3%. (26 out of 665 = 3.9%)	You help out at home: 3.9%; 2hours: 9%; 3hours: 8.6%. (232 out of 665 = 34.9%)
Future expectations	You will work in the State administration 40.9%.	You will work outside of the State administration 43.3%.	
The field studies at this University were chosen as:	First option 74.9%.	Second option 19.2%.	Other options 4.8%.
You receive some type of scholarship in your studies	Yes 41.7%	No 57.1%	
You repeat this subject	Never 93.1%	Once 5.9%	More than once 5%
You repeat subjects of other courses	No 74.6%	One or two 14.1%	More than two 8.9%
Housing during the course	Home 65.3%	Students' residence 9.5%	Rented flat 21.1%.

*Departments and subject innovations (case frequency and percentage):

1. History of Art. *"Initiation research activity and University teaching"*. (n = 254) (38.2%).
2. Modern History. *"New teaching strategies in the History of Sciences and Technologies"*. (n = 7) (1.1%).
3. Morphological Sciences. *"Anatomy of the foot: technical study based on the formative and education research"*. (n = 24) (3.6%).
4. Company Administrations and Marketing. *"Participation approach to enterprise administration by means of projections and case studies"*. (n = 46) (6.9%).
5. Company Administrations and Marketing. *"Development of managerial formation tools: the case study method"*. (n = 38) (5.7%).
6. Teaching of Experimental and Social Sciences. *"Design of curricular materials for teaching and learning Art in Primary Education"*. (n = 25) (3.8%).
7. Teaching and School Organization. *"Internet applications to preservice teacher education"*. (N= 43) (6.5%).
8. Teaching of Mathematics. *"New Technologies in the Teaching of Mathematics"*. (n = 51) (7.7%).
9. Roman Law". *"Seminary of exegesis of information sources. Theme: the patrimonial situation of family children in Roman Law"*. (n = 9) (1.4%).

10. Psychiatry, Personality, Evaluation and Psychological Treatment. *"Role-playing of conflicting situations among handicapped students, their parents and the school"*. (*n* = 61) (9.2%).
11. Architecture Graphic Expression. *"The organization of a thematic classroom of Architecture as a strategy of education innovation"*. (*n* = 74) (11.1%).
12. Architecture constructions II. *"Tasks attribution based upon students' learning styles of learning. Individualization"*. (*n* = 33) (5%).

Table II

Agreement Percentages, Means and Standard Deviations Results for E.U.T.A.Q. Dimensions

Dimensions	Agreement Percentage	Mean	*S.D.*
Clarification	35.3	2.1	.7654
Student autonomy	13.5	2.8	.7522
Professor scaffolding	20	2.6	.6743
Student prior knowledge	22.7	2.1	.7609
Connections	37.6	2.1	.7789
Interrogation / discussion	23.8	2.6	.9859
Explorations based in new technologies	26.9	2.4	.9378
Collaboration and negotiation	29.6	2.3	1.0321
Motivation	21.8	2.1	.8319
Evaluation	23	1.8	.8393

Table III

Analysis of Variance in E.U.T.A.Q. Dimensions for Student Variables in University Class Innovations

Hypothesis	Dimensions	*F-ratio*	*p*
1. Course level	Clarification	16.373	.000
	Student autonomy	11.839	.000
	Professor scaffolding	7.687	.000
	Student prior knowledge	6.15	.000
	Connections	6.870	.000
	Interrogation / discussion	9.371	.000
	Explorations based in new technologies	6.480	.000
	Collaboration and negotiation	24.993	.000
	Motivation	8.400	.000
	Evaluation	5.494	.000
2. University School	Clarification	6.691	.000
	Student autonomy	7.581	.000
	Professor scaffolding	3.399	.000
	Student prior knowledge	4.626	.000
	Connections	5.192	.000
	Interrogation / discussion	3.186	.000
	Explorations based in new technologies	6.595	.000
	Collaboration and negotiation	20.914	.000
	Motivation	4.255	.000
	Evaluation	5.928	.000
3. Gender	Motivation	2.941	.032
4. Age	Professor scaffolding	3.338	.019
	Interrogation / discussion	7.702	.000
	Collaboration and negotiation	10.115	.000
	Motivation	3.066	.027
5. Type of Pre-University Course	Clarification	5.252	.000
	Professor scaffolding	2.666	.031
	Connections	3.014	.017
	Interrogation / discussion	9.621	.000
	Collaboration and negotiation	10.028	.000
6. Academic background	Clarification	4.155	.002
	Professor scaffolding	5.591	.000
	Connections	3.478	.008
	Interrogation / discussion	5.136	.000
	Explorations based in new technologies	3.154	.014
7. Complementary activities while studying	Student autonomy	7.303	.001
	Professor scaffolding	5.591	.000
	Student prior knowledge	4.978	.008
	Connections	4.749	.010

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	Evaluation	3.886	.022
8. Complementary jobs while studying: You teach children	Student prior knowledge	2.766	.019
9. Complementary jobs while studying: You work in an office	Collaboration and negotiation	2.620	.022
10. Complementary jobs while studying: You help doing tasks at home	Clarification	1.927	.020
	Student prior knowledge	2.691	.001
	Collaboration and negotiation	1.943	.019
	Motivation	2.095	.010
11. Future expectations	Clarification	3.735	.024
12. The field studies at this University were chosen ...	Evaluation	3.098	.046
13. You repeat this subject	Student autonomy	6.509	.002
	Motivation	3.278	.038
14. You repeat subjects of other courses	Clarification	10.895	.000
	Professor scaffolding	4.137	.016
	Interrogation / discussion	11.971	.000
	Motivation	4.744	.009

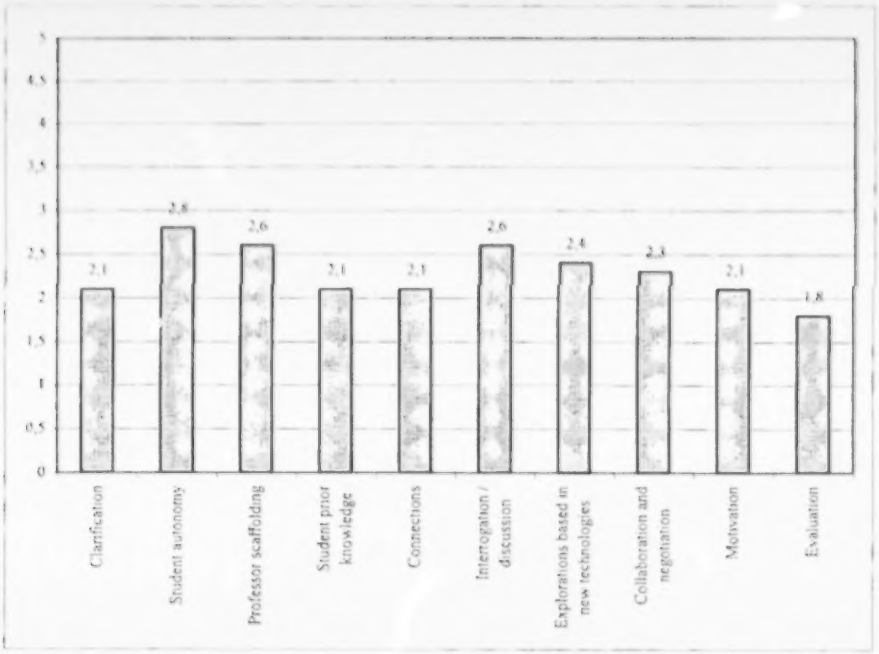

Figure 1. Means on E.U.T.A.Q. Dimensions for all University Class Innovations.

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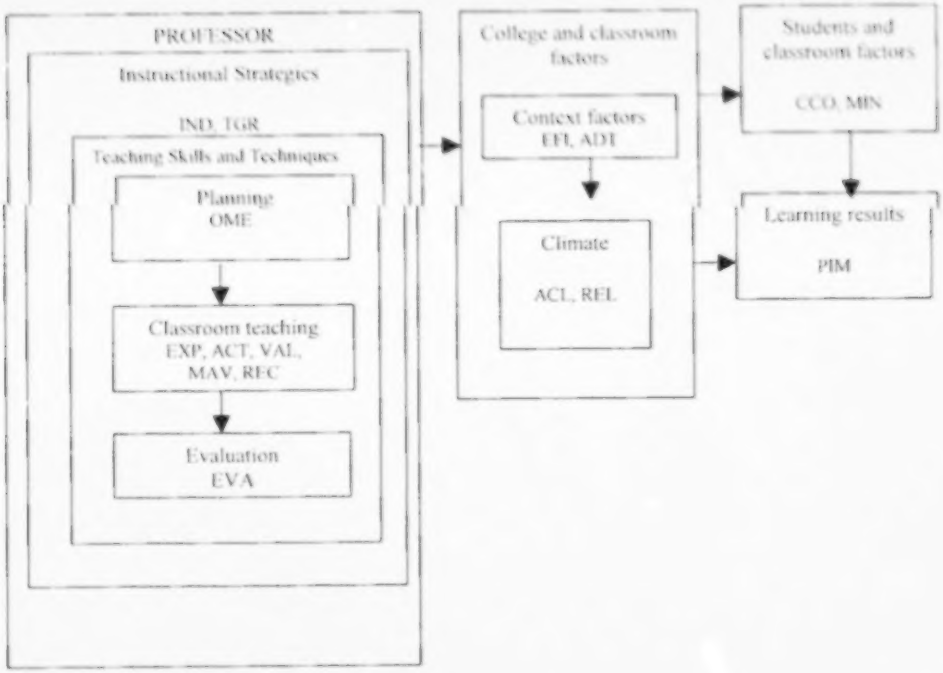

Figure 2. Conceptual map of class innovation teaching.

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